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Power Development in the High Sierras, California

The Western States Gas & Electric Company Are Making Rapid Progress on the El Dorado Development in the Sierra Nevadas, 8,000 Feet Above the Sea, Not Far from Picturesque Lake Tahoe — Description of Unusual Shovel Operation

ONE of the most interesting power development projects now under way on the Pacific Coast is what is known as the El Dorado Development, which the Western States Gas & Electric Company, of Stockton, California, one of the properties of the Byllesby Engineering and Management Corporation of Chicago, have under way in that picturesque part of the Sierra Nevada mountains, south of Lake Tahoe, in California.

The Purpose of the Project

This company operates in one of the richest agricultural sections of this part of the country, and serves more than thirty cities and towns with an estimated population of 170,000. The company has extensive transmission lines in San Joaquin, Sacramento, El Dorado and Amador Counties, by which electricity is supplied for gold dredging operations, mining, irrigation, and industrial purposes. The rapidly increasing demand for power in this section of the country has led the company to float a bond issue of $5,000,000, the proceeds of which are being used for this new project.

General Description of Work

The proximity of this project to the State Highway running to Lake Tahoe makes the transportation problems reasonably simple. All materials and machinery can be transported at a cost far less than that incurred on other similar projects in the High Sierras. The immediate program as outlined to be completed by December, 1923, is essentially as follows:

1. Construction of a new power house in the canyon of the South Fork of the American River about 14 miles above Placerville. Two units of 10,000 K.W., each, are to be installed. Ultimate development to be three additional 20,000 K.W. units, or approximately 80,000 K.W. in all.

2. Enlarging and lining of the 23 miles of El Dorado Ditch from the forebay above the new power house to the intake on the American River near Kyburz just below the mouth of Silver Fork of American River which carries the water from Silver Lake and Twin Lakes.

3. Construction of penstocks. The water wheels in the power house will operate under a 1900-foot drop, which will make this one of the high head plants of the country.

4. Construction of a 70-foot main dam and 26-foot auxiliary dam at Twin Lakes, in Alpine County near the Nevada State Line, to create a storage of 17,000 acre feet.

5. Construction of a diversion dam in the South Fork of American River at the head of El Dorado Ditch just below Kyburz.

6. Construction of a double transmission line to connect new plant with present transmission system.

Ultimate Program

The potential storage which it is proposed to develop is about 93,000 acre feet in six reservoirs, some of which is already existing. The program is as follows:

(a) Twin Lakes: Present — 17,000 acre feet. Ultimate — 25,000 acre feet.
(Note: 17,000 acre feet after completion of dam under construction.)
(b) Silver Lake: Present — 5400 acre feet. Ultimate — 25,000 acre feet.
(c) Echo Lake: Present — 2000 acre feet. Ultimate — 2000 acre feet.
(d) Medley Lakes: Present — 5000 acre feet. Ultimate — 10,000 acre feet.
(e) Alder Creek Reservoir: Present — None. Ultimate — 25,000 acre feet.
(f) Plum Creek Reservoir: Present — None. Ultimate — 6000 acre feet.

The center of operation is Headquarters Camp situated on the State Highway at the 14-mile stone above Placerville. Here the supplies for the Power Plant and El Dorado Ditch operations are stored, and the field administration for the whole project is maintained. The operations of the whole development, with the exception of those at Twin Lakes, are being done electrically. Power is obtained from a temporary transmission line connected to the present 60,000-volt line of the West-

ern States Gas & Electric Company, near Placerville.

Work Now Under Way

The site for the forebay has been cleared of timber and construction of the dam has commenced. This is to be a 90-foot earth dam with a concrete core wall and will create a storage of about 900 acre feet. This will maintain the operation of the power house for approximately four days after the intake of water has ceased. From the forebay a pipe line will carry the water to a surge tank at the head of the penstocks, a distance of approximately two and one-half miles. The grade to be used for this pipe line is practically completed and about one-third of a 700-foot tunnel has been excavated.

The excavation for the foundations of the surge tank are under way. This tank will be 246 feet tall, the tank portion being 126 feet long and 18 feet in diameter. This will regulate the sudden fluctuations in the flow of the water to the turbines due to change in load on the generators.

The power house has been connected to the outside world by the construction of approximately 3 miles of 10 per cent. grade road which runs from the top of ridge to bed of river. The power house site has been graded and construction on the building has begun.

Steam Shovel Operation, Placerville Project

At the Placerville end of the work the company has three steam shovels in operation, two 14-B Bucyrus revolving shovels, with ¾-yard dippers, and one 30-B Bucyrus shovel with a 1 cubic-yard dipper, all mounted on caterpillars.

The first task laid out for the 14-B shovels was the construction of the above mentioned road. The work was extremely heavy, being for the most part side hill work along the side of the canyon, up a 10% grade, 75% of which was through solid rock. Our photographs illustrate, clearer than can words, the character of the excavation. The difficulties were numerous. The rock was of such a character that it did not break up well in blasting.

The 14-B's started operations on May 10, 1922, and finished in a little better than two months. The 30-B Bucyrus was first put to work excavating for the grade for the pipe line, mentioned in a preceding paragraph. All three shovels are now

Shovel operations in the borrow pit at Twin Lakes. Two 30-B Bucyrus shovels equipped with wood-burning boilers are used in conjunction with Holt tractors and La Plant-Choate wagons. One of the Twin Lakes may be seen in the background.

being used for excavating the 300,000 yard earth dam for the forebay.

The El Dorado Ditch

The construction on the El Dorado Ditch is progressing rapidly. In sections where leakage is bad, a concrete lining is being installed by a process developed by engineers of the Byllesby

Beginning the penstock grade at Camp K, on the Placerville end of the project. A 14-B Bucyrus doing a little side-hill cutting.

Engineering & Management Corporation. Reinforced concrete slabs are made upon semi-circular steel forms by the use of a gunite machine and allowed to harden, then are placed in the ditch while the water is still flowing, as the operating conditions require the flow to be maintained in the ditch. Where the leakage is not bad, the ditch is being graded and lined with wood panels about 6 feet wide and held in place with ¾-inch pipe driven into the bottom of the canal. This process is also a development of the engineers of

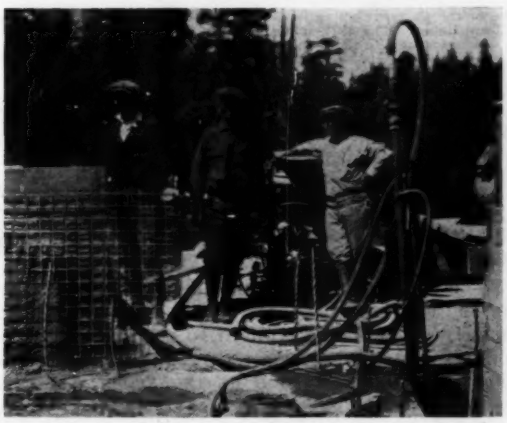
The shovels on their 35-mile jaunt from Minden, Nevada, to Twin Lakes Camp. The upper view shows a 30-B fording Carson River. To the left is one of the 12 to 15 times they had to cross this stream. 14 x 22-inch timbers were carried along by tractor for reinforcing these small bridges.

the Byllesby Company. As the necessity for greater amount of water arises, this wood panel lining will be replaced with the standard concrete lining and the whole ditch will eventually be concrete lined. The bad gulches are being flumed, and through two of the worst, steel siphons are being installed which reduces the total mileage of the ditch materially.

The material used in the lining of the ditch is being transported in round tub-like boats from the head of the ditch to point of use. These tubs or boats are then telescoped over each other and hauled back by trucks. This method has cut the transportation cost from 25 cents per ton mile to 2.5 cents per ton mile.

Operations at Twin Lakes

At Twin Lakes the installation of a 70-foot main earth dam and a 26-foot auxiliary concrete and earth dam with reinforced gunite core

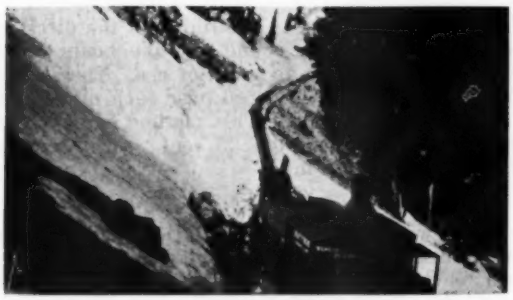


Left to right: H. H. Leventon, Superintendent, at Twin Lakes; Leo Stewart, Assistant Superintendent; and one of the engineers.

diaphragm is under way. Here all work is being done by machinery, two more 30-B Bucyrus shovels load the earth on dump wagons and it is then hauled to the dam by caterpillar tractors, each hauling three dump wagons. Trucks are also being used to haul earth. Through the aid of electric lights furnished by a 75 K.W. portable generator the work is being carried on 24 hours a day and approximately 5000 yards of earth are being moved daily.

The 30-B shovels were unloaded at Minden, Nevada, and were brought in over the roughest kind of road to the work, a distance of about 35 miles. The shovels were towed most of the way by Holt tractors. Although this was towards the last of June, the roads in the valley were so soft that the shovels were mired several times daily. They crossed the mountain stream shown in our

view at least 15 times. When they got higher up the pass they struck snow. Several methods of clearing the road were tried. Some heavy drifts were blown out with dynamite, and some were "sanded" in order to quicken the melting, but it usually was left to the shovels to dig their own way through.



One of the shovels digging its way through snowdrifts to its job at Twin Lakes. The dark spots in the snowdrift are where dynamite was used to shoot out the drift. This photo was taken on the 28th of June.

Once at Twin Lakes they were put into a borrow pit, and are now engaged excavating 300,000 cubic yards of earth fill for the dam.

The company has assembled a large fleet of equipment at this point consisting of Holt caterpillars, 6-yard La Plant-Choate wagons, trucks, crushers, drills, scrapers, Fresnos, mixers, etc.

The shovels are all equipped with wood-burning boilers with two fire doors to make firing easier. The wood is brought to the job by trucks and also by a small Holt caterpillar, which has been dubbed on the job as the "cootie." This tractor tows a wagon with a rack for cord wood.

The project is in charge of H. H. Fisher, General Superintendent with headquarters at the Placerville end. Superintendent H. H. Leventon is in command of Twin Lakes Camp. Mr. Leventon is well known in California, having formerly served with the California State Highway Commission. Leo Stuart is Assistant Superintendent.

This shows the character of the digging that the two ¾-yard Bucyrus shovels went through on the Power House Road. This was taken ahead of one of the shovels after blasting.

Due to the short season in which work can be done in these high altitudes, remarkable progress is being made in the construction of this dam. The outlet works are completed and fully 35 feet of the earth fill had been made by the first of November at which time a heavy fall of snow made it necessary to close down the work for the winter.

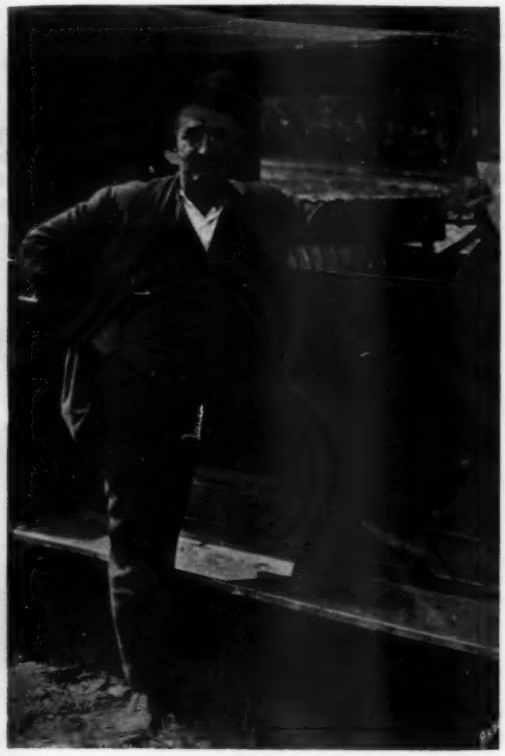
Work will be resumed in the spring and pushed to completion during 1923.

A One Hundred Thousand Yard Park Board Job in Kansas City

THE well-known Kansas City road contractor, H. H. Hannankratt, is adding another achievement to his already lengthy list of successful road contracts around that city.

This work is part of Kansas City's ambitious plan for extending and improving its extensive park system according to plans suggested by Geo. E. Kessler, the widely-known landscape architect, who is mainly responsible for the beautifying of Kansas City and St. Louis. Kansas City is proud of its park system and quite rightly so. The work is in Swope Park, just within the city limits to the southeast in a beautiful wooded rolling country. Here the Park Board has under way an improvement involving the removal of approximately 100,000 cubic yards of earth. This work contemplates the grading of the Mall and drive from the entrance of the park on the east, west through the park to a point near the Zoo, a much needed improvement, and the cutting and grading of a north and south road as yet unnamed, from the north boundary of 63d Street across the park just west of the Zoo Building, connecting with the park drive on the south. This provides a north and south artery through the park.

The contract for the excavation was awarded



If you catch Mr. Hannankratt you must catch him on the fly as he is always on the job. He is well known as one of the most successful road contractors in Kansas City.

to Mr. Hannankratt at 24 cents per yard, who is handling the work in the most up-to-date fashion with equipment in keeping. This outfit consists of an 18-B Bucyrus revolving shovel, a Western elevating grader, a 5 to 10-ton Holt, tractors, and a fleet of dump wagons.

Work was started the first of August. Mr. Hannankratt, very soon after he got his outfit in action, struck a 30,000 yard cut, consisting mainly of flint rock. It was such a cut that would lead the average contractor to organize his blasting crew, but Mr. Hannankratt attacked it with his little Bucyrus, "as she lay," and waded through with no difficulty whatsoever, without the use of a single stick of dynamite.

The shovel of course is doing all the heavy digging, and the elevating grader the light grading. The tractors are being used principally to haul the elevating grader and to serve it with dump wagons. It is an inspiring sight to see that outfit in action. As a general rule three trains of two 6-yard wagons are used. These are of various makes, Western, La Plant-Choate, and one Stroud.

The shovel is being served by teams ranging from three to six, depending upon the length of the haul. The excavated material is being used for filling in low spots and grading. The bituminous macadam pavement will be laid by the City Park Department.

Mr. H. H. Hannankratt's 18-B Bucyrus with William Mohler at the Levers, Grading for the Extension of the Mall in Swope Park, Kansas City

Another piece of work that will soon be undertaken by the Park Board is the excavation of the fish ponds in the fish hatcheries and the deepening of the lagoon. These ponds will be dug to a maximum depth of six feet.

As can be seen from our photograph, Mr. Hannankratt is constantly on the job doing all the work of superintendence, and the result shows in the smooth way in which the work has progressed. William Mohler is operating the shovel.

It might be added that Mr. Hannankratt has recently completed another important contract for the Park System, namely the extension south from 48th Street of the Pasco, to the city limits. The Pasco, being one of the main north and south traffic ways, is a most important artery of the Park System.

Mr. Hannankratt's grading outfit was strictly up to date. Here is a Western elevating grader served by three teams of 6-yard wagons hauled by 10-ton Holt tractors.

Grading and Road Work in South Bend, Indiana

Description of H. L. Davis Company's Revolving Shovel Operation on Subdivision Work

SOME time ago when the Studebaker Corporation of South Bend, Indiana, opened up a beautiful little tract of land south of that city, subdivided it, and erected homes to be sold to the general public at most reasonable prices, H. L. Davis & Company, well-known contractors of that city, were called upon to take part in the preparation of the land for the building of the homes. A considerable amount of grading was necessary and streets and highways were to be cut through. Mr. Davis tackled this job with a 14-B Bucyrus and in short order completed all of the paving and the excavating.

In fact, this Company met with such success with this contract that on October 10th of this year, they were awarded the contract for 55,000 yards of excavating and grading on what is known as the Chas. Weidler addition, an 80-acre tract of land owned by the Chas. Weidler Realty Company of that city. This beautiful little section of town adjoins the Studebaker addition on the south and when completed will be subdivided and sold in a similar manner to that of its sister section.

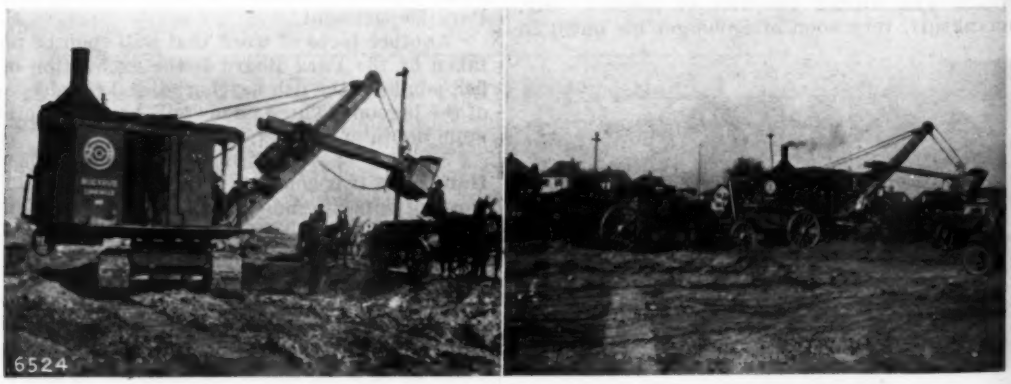
Before this work was started, however, Mr. Davis sold his 14-B, purchased a Bucyrus 20-B ¾-yard high lift shovel mounted on caterpillars and almost immediately began work on his new contract. The contract called for 50,000 yards of excavating at 42 cents a yard.

The first part of the work consisted of tearing through a twenty-thousand-yard cut through a hill at High and Victoria Streets, and the grading of a road extending from High Street through this tract to Donnoyer Avenue, a paved highway leading to the outskirts of the city from South Bend.

Material and Method of Operation

The character of the material encountered up to this time has been for the most part comparatively easy digging, consisting mostly of sand and red clay, which with a little rainfall becomes soggy and heavy. However, this fact has not prevented the shovel from keeping up an average of from 700 to 800 yards daily. It has progressed with noticeable steadiness and regularity of operation. Frank Reiger, the operator, has taken excellent care of the machine and no unnecessary shovel delays have yet been experienced.

H. L. Davis and one of his sons, H. C.; Harold, another member of the Davis household, is seen in the background standing on the shovel.



Two views of the Bucyrus 20-B Bullseye shovel owned by H. L. Davis & Co. of South Bend, Indiana. Mr. H. L. Davis is seen in the picture at the left standing under the boom.

At the left: Frank Burger, the operator, at the levers. Right: Frank Burger and Harold Davis. Harold is making the smoke.

The average haul has been about 300 yards and most of the spoil has been used for grading and filling in the lower portions of the land.

Equipment

The material is hauled to the fill in eleven 1½-yard bottom gravity dump wagons, four of which are Western, four Studebaker and three Troys. Mr. Davis has used as many as twenty teams on the work, but with a short haul such as this, eleven will easily suffice. Water is hauled to the job in a Goshen 600-gallon tank from a city water main about a half mile from the work.

The work has progressed rapidly and with the usual success that accompanies Mr. Davis and his crew. H. L. Davis & Company is a more or less family affair. H. C. Davis is a member of his father's firm and is largely responsible for a great deal of the work. Harold, another member of the Davis household, is firing the shovel.

Mr. Davis has taken an active part in contracting work about the city of South Bend for a number of years. We are indebted to Mr. Davis for this information.

Sewer Construction Work in Gary, Indiana

M. W. Holben Has Large Sewer Contract with City of Gary, Indiana

IN August, 1921, M. W. Holben of Gary, Indiana, was awarded the contract for the complete installation of a sewer system in District 36, a portion of land about six miles south of Gary.

The contract involved the work, in its entirety including 120,000 yards of excavation, of laying 11,200 feet of 12″ to 24″ pipe, and of installing a $17,500 automatic electric pumping station at a price of $65,000. A price of $4.00 a foot for laying the pipe included everything. All of the material was purchased by Mr. Holben himself.

Actual work on this job was started in November, 1921. About 9,400 feet of the work was done with a Monighan 1-yd. machine, which did both the excavating and the backfilling. After the work was well under way and the digging be-

Bucyrus 30-B dragline digging a 13-foot sewer in Gary, Indiana. The cut will be 27 feet in depth at crest of hill in background.

came more difficult, Mr. Holben began to feel the need of another machine. With two machines in use, one could be used in the excavation, and the other in backfilling. Therefore, in the summer of this year, a Bucyrus 30-B Steam Dragline equipped with a 1-yd. bucket and additional clamshell equipment, and mounted on caterpillar traction, was purchased, and almost immediately put into operation.

The dragline was used in making the cuts while the Monighan was used for backfilling.

The character and depth of the digging was a problem worthy of much consideration, for it not only involved a hard and sticky blue clay with an overburden of soft sand, but a great deal of water against which pumps were used to no avail. Mr. Holben tells us that, at times, the pipe had to be laid almost simultaneously to taking out a bucket full of mud and water. Their difficulties were

Bucyrus 30-B dragline owned by M. W. Holben of Gary, Indiana. Billy Genberling the operator is standing at the levers, while Elijah Ellis, the fireman, seems to be interested in what is going on inside.

added to when a slight disturbance would cause a complete landslide of the soft sand from above.

In spite of such difficulties as these, an average of 350 to 400 cubic yards was made daily, which is creditable indeed, considering the toughness of the excavation combined with the delays incidental to laying pipe in a flooded trench subject to frequent cave-in.

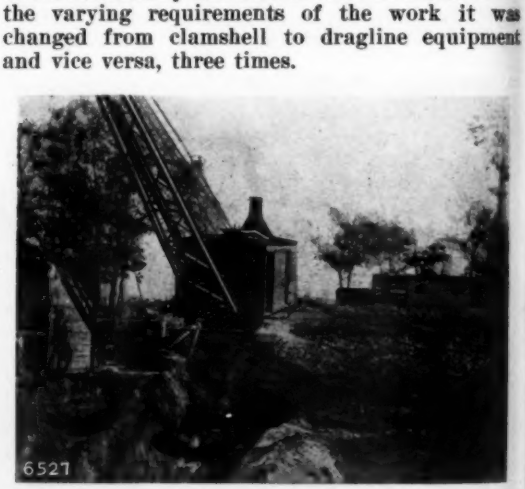
The work on this contract was completed in August, 1922, and the work has met with such success that M. W. Holben was awarded a similar contract for District 42 which is near District 36 on the north.

This contract was awarded in September of this year and work was started almost immediately upon the completion of the former. It called for 4600 feet of pipe line of varying sizes from 12″ to 24″ and about 35,000 yards of excavation and backfilling. The price was $4.40 to $6.00 a foot. The average cut on this job was about 14 feet, although at times a 25-foot cut was encountered.

The material, however, has been much more conveniently handled on this job than on the other. It has consisted almost entirely of soft

M. W. Holben Supervising the Work

sand and a yardage of from 700 to 800 yards has been possible at times when no water was encountered in laying pipe. The Bucyrus 30-B dragline has been used almost entirely for excavating while the Monighan has been used in backfilling. An example of the value of a "universal" machine on work of this character was evidenced by the fact that to fit the 30-B for the varying requirements of the work it was changed from clamshell to dragline equipment and vice versa, three times.



The Bucyrus 30-B Dragline Breaking Ground on District No. 42

Very little trouble has been encountered in disposing of the water on this job. A Gould triplex pump has been used and has been more than satisfactory. The manholes have been installed under subcontract at $25 apiece and, up

to this time, have been constructed of concrete. Mr. Holben tells us that from now on brick will be used since cooler weather is likely to cause too long delays in waiting for the concrete to set.

Coal has been purchased from Gary at $9.00 a ton. About ¾ tons have been used daily. One 9-hour shift has been operated. They have not done any night work.

Another sewer job which M. W. Holben contracted for was a job they took under subcontract from John Apostol of the same city for the city of Gary.* The contract called for 600 feet of 12″ and 1500 feet of 15″ pipe and about 12,000 yards of excavating and backfilling. The work on this job was carried on in a manner similar to those of Districts 36 and 42. All material was furnished by the general contractor.

Mr. Holben has been identified with contracting work in the vicinity of Gary for the past twelve years, and his name in that city is a byword in the contracting field. He believes in keeping several irons in the fire at the same time and at the present moment he is laying up 30′ reinforced concrete pavement with curb, which when completed will be about a half mile in length and will involve about 7000 yards.

The present work, however, is taking up the greater portion of his time and probably will until the holiday season which will bring the work to a close. Philip Lewis is Superintendent on the work. Billy Gemberling is operating and Elijah Ellis is firing the Bucyrus 30-B, while Orville Cunningham is operating and John Maher is machine tender on the Monighan. We are indebted to Mr. M. W. Holben for this information.

*Two contracts, one City of Gary and the other School City of Gary, but constructed as one under one subcontract with Mr. Holben.

Motor Truck Haulage: When, Why and How

By P. L. Sniffin

MORE and more the hauling phase of the excavating engineer's business is trending toward the use of motor-driven vehicles. Motor trucks, varying in numbers and capacities according to the size and scope of the contractor's business, have come to be indispensable factors in this field.

What, then, are the main points that govern the excavating engineer's successful use of motor hauling equipment to obtain the maximum of utility and service at the minimum cost per unit hauled. Briefly touching upon the high points in this respect, the following five suggestions are given as being based on the summarized experience of successful truck operators:

1. Let actual conditions govern the use of trucks rather than set, inflexible rules.

2. Use motor trucks only when they afford greater advantages than any other agency of transportation available for that particular job.

3. Always in the employment of trucks remember that depreciation, maintenance and interest on the investment represent a large share of the total cost. Therefore, plan constant utilization so that they may work as many hours as possible during their lives.

4. In estimating the number of trucks necessary consider average requirements, not maximum requirements. At the same time do not overlook a small surplus which will permit regular overhauling of the entire fleet.

5. Select trucks so that their full tonnage capacity will be used, with weight of goods given first consideration over bulk.

Motor Trucks vs. Horses

The advantages possessed by motor trucks over horse-drawn equipment for the excavating engineer lie in their greater speed, capacity and resulting economy for most general purposes. On the other hand, the advantages of the horse-drawn unit lie in the lower first cost of the equipment. A good basis for determining which of the two is most economical is that of idle time involved. Since a horse and cart represent a smaller investment, the carrying charges of depreciation, maintenance and interest on the investment are smaller and the cost of idle time proportionately less. This idle time may be considered as either wasted time of the equipment when it is in the

Motor Trucks Have Come to Be Indispensable Factors in This Field

stable or as standing time during loading and unloading periods. Therefore, on shorter hauls, where the time spent for loading and unloading is high in proportion to the actual running time, it is reasonable to assume that horse-drawn equipment is better adapted. Likewise, where hauling demands are unsteady, rising and falling at intervals, and where the equipment would be unused for a considerable length of time, it obviously would not pay to invest heavily in motor units.

However, it is well to remember that the use of motor trucks offers great possibilities for increasing the extent of the excavating engineer's business. Work can be accomplished that cannot be handled with horses. Contracts can be undertaken at longer distances, and especially where the hauling equipment works in conjunction with modern steam shovel loading devices the greater speed and capacity makes the work more profitable. It may be said that most successful hauling systems combine both forms, the equipment comprising the maximum number of motor trucks that can be kept continually busy, supplemented by enough horse-drawn units to take care of shorter hauls conveniently and to fill in during rush seasons.

In addition to the advantages of increased scope and economy possessed by motor trucks over horses the feature of dependability is also of great importance. Very often it is found that under severe weather or road conditions, horses are either unable to handle the work or they are unable to accomplish it without considerable delay and extra expense. The dependability of the motor vehicle permits maximum use of steam shovel equipment at all times and assures a minimum of idle labor time.

Difficulty is frequently experienced in employing and holding good teamsters, and this fact adds another point in favor of the motor truck. The driver of a motor truck, being usually of a preferable type, can be encouraged to take an interest in his work and pride in his vehicle.

Points on Truck Sizes

Regarding the most economical size of truck to install, it may be well to point out that per unit of capacity hauled, the first cost, maintenance costs, operating costs—in fact, every item of expense—decreases as the size of the truck increases. A prominent truck authority places the average relative cost per ton-mile as follows: one and one-half-ton truck, 16 cents; two-ton truck 13 cents; six-ton truck 7½ cents. Obviously, this rate decreases still more up to the 7½-ton size. It can be seen, therefore, that when unit hauling costs are considered, it is more economical to haul in large trucks than in small ones. However, it is possible to waste more than enough carrying capacity to make up for this saving by installing a larger truck than the contractor's average daily loads require.

Buying vs. Renting

Before installing each additional motor unit, the excavating contractor might well consider whether purchasing such a vehicle involves enough idle time in the course of a full year to make up for the difference in cost between an owned truck and one that is rented when extra equipment is needed. Very roughly, it may be estimated that the cost per day of a rented truck is slightly more than double that of one owned by the contractor, assuming, of course, that the latter is kept busy for a full working year. On this basis—and the individual truck owner may readily determine the comparative costs in his own case—it may be seen that when there is enough work to keep a truck busy for half of the year, it is more profitable to own a truck than to rent one.

Truck Selection

The first requisite of a motor truck for use in excavation work is its ability to stand up under severe strains, and unless it is so qualified there is little hope for its successful and economical use in this field. The accompanying illustrations indicate features of the work that every excavating engineer is familiar with. It is always well, of course, to adapt these conditions as best they can be adapted to aid truck operation, but frequently it is necessary that considerable rough usage be inflicted on truck equipment in this respect. Often, in loading, a mass of earth or rock is dropped on the truck from several feet, and in discharging the load the truck is frequently run forward and then backed sharply against an obstruction several times. Such procedure produces a terrific shock on the body, springs and chassis, yet speed in loading and unloading is the determining factor of profit on such work. Consequently it is essential that the excavation engineer exercise extreme care in selecting a quality motor truck that will give long, continuous, dependable service under his working conditions. First cost is far from being the most important cost in the end, since the successful truck purchase is one that renders efficient service at the lowest cost per ton-mile *over a period of years.*

A feature of motor truck selection that should not be overlooked is the advantage offered by the dump hoist type of body, offering the contractor a valuable saving in unloading time. Hand unloading is expensive at best, both because of the labor cost and the idle truck time during the unloading periods. The dumping feature allows the truck body to be raised to a proper angle quickly and without trouble.

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Business Outlook

As we go to press, the outstanding feature of the business situation is the extreme car shortage, against which we warned our readers several months ago. But even the financial prophet failed to appreciate how bad this shortage was to be. Already it has broken all previous records, and appears likely to go even further, especially if a hard winter should set in; although orders for new rolling stock are increasing. Fully three-quarters of the new cars purchased are merely replacements.

Accordingly we again urge our readers to look as far ahead as possible in the ordering of supplies. Do not expect quick deliveries.

Another reason for ordering at once is that prices are still rising, as prophesied. Although the peak has probably been reached in most lines, it will be some time before a recession sets in.

But in spite of the car shortage and rising prices, now is the time to prepare to take on more work. Continued money ease seems assured for many months, which should stimulate opportunities for contracts.

To those of our readers who are in construction lines, we call attention to the fact that, with business continuing to improve, there should be no seasonal slump this winter. Modern power shovels can operate as easily in winter as in summer, once they get below the frost line; and the methods of using cement in cold weather have been so perfected, as to make operations at this time of the year unusually profitable. In addition, the advantages of keeping one's organization intact should be evident to everyone. There is no excuse in many lines of work for anything less than a twelve months' construction season — except the excuse of bad habit.

To coal operators we again say that there is still opportunity for expansion. Although soft coal is now two dollars a ton below peak prices, it is still over twice the figure quoted at the beginning of the strike and four times the pre-war figure. The present output is barely keeping up with current requirements, and is piling up no reserve. As soon as winter really sets in, anthracite users will be driven to bituminous; and this fact and the steady business improvement will prevent any marked price recession, if it does not indeed cause a rise again.

The only factor holding back business is the car shortage already alluded to. The chief factor holding back some business men from grasping present opportunities is the fear that the expansion of credits now going on represents an inflation like that of 1920, which was followed by the collapse of 1921. But the present expansion differs from that of 1920 in the important fact that deposits are now increasing at an even faster rate than loans. Inflation is caused by a divergence between loans and deposits, rather than by any increase in loans considered by itself.

Thus the winter looks like an unusually active and prosperous season for excavating engineers in all lines of work.

· FIELD NOTES ·

Device for Feeding Boiler Compound into Steam Shovel Boilers

T. P. Ward, General Foreman of the White Rock Department of the Kelly Island Lime and Transport Company, Clay Center, Ohio, has sent us the following description of a device for feeding boiler compound into their steam shovel boilers, which has proved very satisfactory. He writes as follows:

"We found that by putting compound in the water tanks of our shovels that the great portion of it settled in the bottom and consequently was not giving good service.

"About six months ago we placed a container between the injector and check valve on the boiler feed line. As soon as the injector is in operation the valve at the bottom of the container is opened and the contents carried into the boiler.

"These containers can be made to hold any required amount for a twenty-four-hour period. The one which we used is made of a piece of 5-inch pipe 10 inches long with top and bottom

EL DORADO PROJECT, WESTERN STATE[illegible]AS

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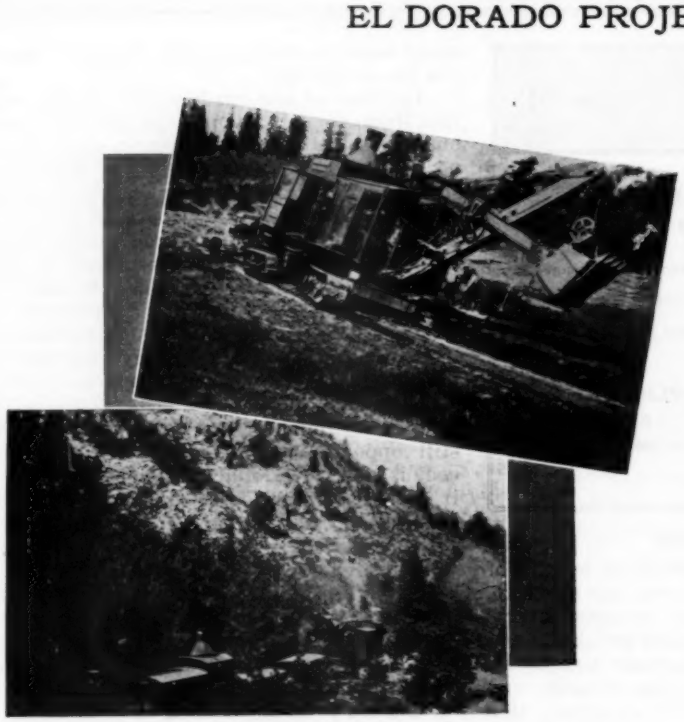
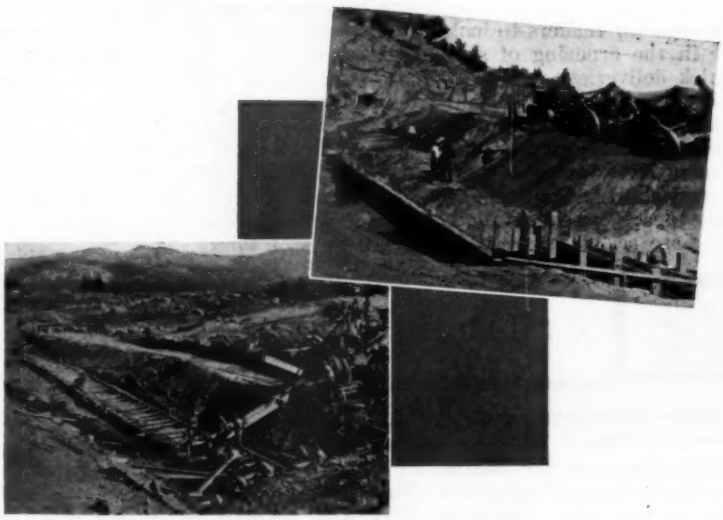


Two 30-B Bucyrus Shovels Travelled 35 Miles Over the Roughest Kind of Road from Minden, Nevada, to the Site of Operations at Twin Lakes

In the Borrow Pit at Twin Lak[illegible]eria



Operations Under Way on One of the Dams

A 30-B Bucyrus shovel o[illegible]the
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S & ELECTRIC COMPANY, CALIFORNIA

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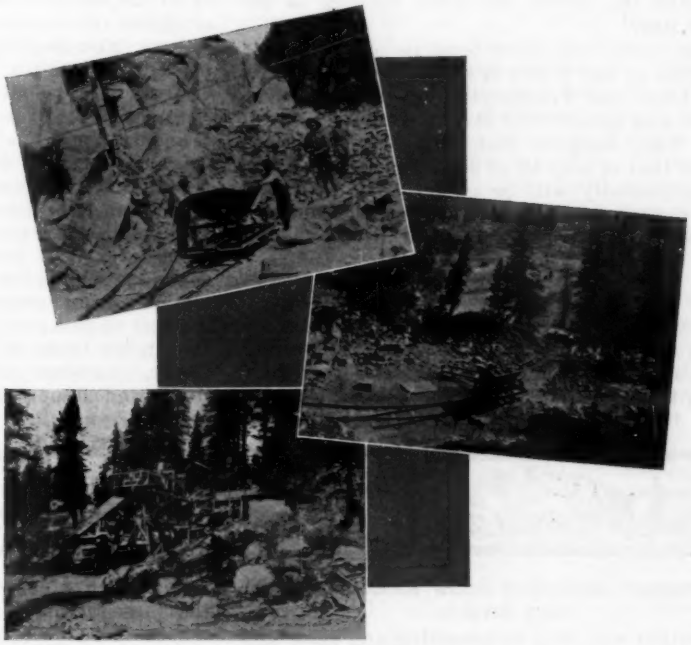
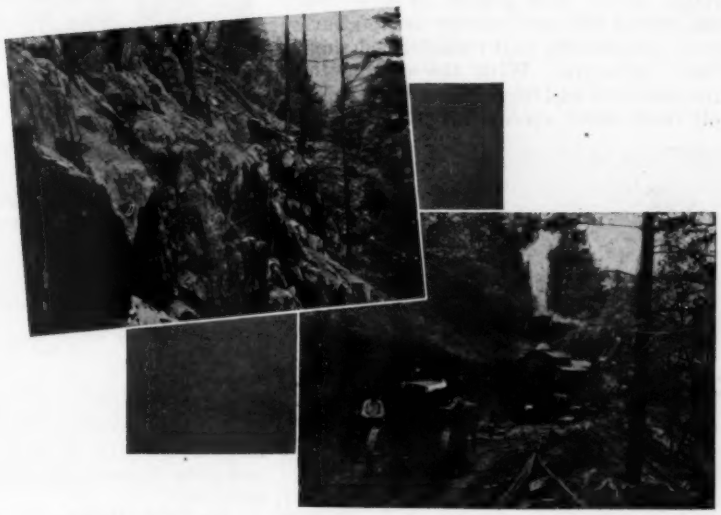


Views of the Quarry and Crushing Plant at Twin Lakes Camp, Where Rock Is Prepared for the Dam

the site of opera-
a 40% grade
stream.



An example of the type of digging encountered by two 14-B Bucyrus shovels in excavating for the Power House Road. In the lower view an Ingersoll-Rand Compressor may be seen in the foreground. This was used in operating rock drills ahead of the shovel.

heads welded. The top has a one-inch plug for filling, and the bottom has same opening as the injector line."

These containers have been in operation for six months at the White Rock Plant of the Kelly Island Lime and Transport Company, and were designed and installed by Mr. Ward.

Mr. Ward suggests that we pass this on with the hope that it may be of some benefit to others. This undoubtedly will be of value to all steam shovel operators who have encountered water troubles, but particularly to those whose shovels are not equipped with scale chambers.

Grading Costs on Federal Aid Roads

A great variation in the conditions under which grading for highways is done in different sections of the United States is reflected in cost data compiled by the Bureau of Public Roads on 1,350 projects of federal-aid road. The figures cover the four-year period, 1917-21, and are based on a total of 24,526,415 cu. yds. of earth. For the groups of states the average price per cubic yard is as follows: New England and Middle Atlantic States, $1.33; East North Central, $0.68; West North Central, $0.49; South Atlantic, $0.61; East South Central, $0.41; West South Central, $0.35; Mountain, $0.52, and Pacific States, $0.61. The general average price was $0.56. Probably the most important factor affecting the cost was the amount of grading to be done per mile, the quantity being very small in the groups having the highest prices. In general it is noticed that where mostly old roads are rebuilt the light work and tearing up the old pavement greatly affected the cost. The amount of fine grading or trimming required for the higher types of pavement was also a factor. Labor, character of soil, climate, contract time limits and detour expense affected the cost.

—*Engineering News-Record.*

DEVICES YOU OUGHT TO KNOW ABOUT

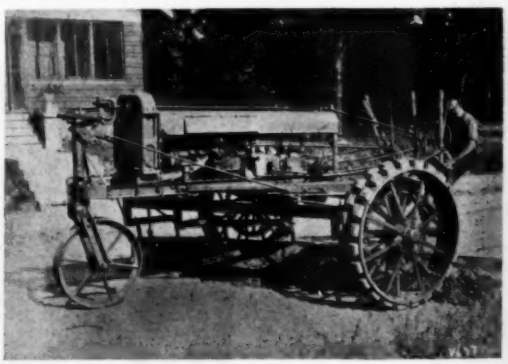
Another Method of Snow Removal in City Streets

Now that winter is approaching and snow and ice will soon be a bane to street and highway traffic, a short review of the Avery "Road-Razer" is not untimely.

We publish below photographs of this one-man machine, which has successfully shaved hard rutty roads to smoothness, and transformed them into excellent highways. With the aid of the scarifier attachment it has torn up gravel, crushed rock and oil roads most successfully.

The Avery "Road-Razer" Removing Snow from a Concrete Highway

The most common method of using the Avery "Road-Razer" has been to take advantage of the scarifier first, which is raised and lowered at the will of the operator. After using the scarifier, which performs the hardest part of the work, the three-section blade is lowered and run over the surface, smoothing down and clearing away the undesired material from the road.



Side View of the Avery "Road-Razer" with the Three-section Blade in Operation

This versatile little machine has not only been put to this use but has also shown how easily it may be adapted to cope with winter conditions, when the removal of heavy snow and ice has been involved.

Mr. Ed. Buchanan, Street Commissioner of the City of Salina, Kansas, has had splendid results from this machine. He writes as follows:

"Some time ago I wrote you in regard to how well we liked our Avery 'Road-Razer' for working dirt streets. We have found another use for it.

"We find it a great machine for clearing off the snow, and it does it so nice and clean that the streets are dry in a short time. Our man can clean off miles of streets in a day after a heavy snow at a very little expense. It's the best snow machine we ever saw."

Mr. H. V. Brassfield of Great Bend, Kansas, has had a similar experience, and regarding the performance of his machine said that he had cleared off over a half mile of wide street on two sides of the public square in that city where the snow had been packed ten inches deep and in some places frozen into ice. He went on further to say that the method which he had found most effective was to clean out the snow and ice from the gutter first, and later the cut in the middle, leaving the center ridges to be disposed of last.

Because of the demand among counties, townships and contractors for the use of this machine on gravel, crushed rock roads and city streets, the Avery Company has adopted a rubber block tire wheel equipment. This equipment has proved very satisfactory, since the rubber tires tend to lessen the vibration which makes it much easier for the operator and better for the machine.

Further information on the Avery "Road-Razer" may be obtained from the Avery Company, Peoria, Illinois.

New Miami Fordson Trailer

The constantly increasing use of the Fordson Tractor in commercial hauling and other industrial work has created a demand for special hauling equipment designed to be used with it. To meet this demand, the Miami Trailer Company, Troy, Ohio, has just announced a new special Miami Fordson Trailer.

This trailer is of all-steel construction except wheels and tires. It has a rounded load capacity of 2 yards, with provision for mounting a separate flared top box of ½ yard or 1 yard extra capacity for transporting materials of a total load

New Miami Fordson Trailer in Service

of 2½ tons, but of greater volume than 2 cubic yards. With ample factor of safety the carrying capacity is 2½ tons.

The body, which is of 10-gauge steel, well reinforced with heavy angle arms, is designed with a rear bottom dump door, so that the size of the opening may be controlled either to dump the entire load in one spot, or to spread the contents 60 yards wide to any depth desired. The entire load dumps back of the axle and behind the wheels of the trailer. The load is practically balanced on the axle, sufficient weight being placed on the drawbar to prevent wear in the hitch connection. The special automatic hitch bolts on to the rear housing of the tractor. The Fordson is simply backed up to the end of the trailer drawbar and the coupling is completed without pins or cotter keys. Only a slight upward pull on the drawbar is necessary to disconnect the trailer from the tractor.

Both release and winding levers of the trailer are placed at the right hand of the tractor driver. This eliminates the necessity of stopping to dump or spread the load, or to rewind the dumping door. Such flexibility of operation greatly reduces ton-mile costs.

The turning radius is that of the Fordson Tractor. The unit can be backed into any position or can be turned around easily on the sub-base of a road. This flexibility is important for operation in close places.

The Miami Fordson Trailer is especially fitted for road and street contract work; for repairing of streets and roads; for hauling and spreading crushed stone, gravel, cinders or dirt; for transporting concrete mix over subgrades; for hauling brick; for hauling hot asphalt; for building and excavating work; for constructing dams, levees and embankments; for coal deliveries at curbstone and manhole; for transporting refuse sand from foundries; for garbage and refuse disposal in cities.

The operation of the Miami Fordson Trailer is so simple that it can be handled by any boy who can drive a tractor. The Miami Trailer Company claims that one man with a Miami Fordson Trailer can easily transport as much material in a 10-hour day as three men and three teams.

This new model Miami Trailer, while designed to be used with the Fordson tractor, is equally well adapted for use with all other tractors with a drawbar rating similar to the Fordson. It can also be used with 2½ and 3-ton high-speed trucks, as the equipment is mounted on Timken roller bearings and can be subjected successfully to the speed of the high-speed truck. Specifications are as follows:

Track	60"
Axle 3% Nickel	2¼" Square
Bearings	Timken Roller
Wheels, Artillery	36 x 5"
Tires Pressed On	36 x 5"
Springs	42" long, 3" wide, 11 leaves
Frame Rolled Channel	5"
Body Steel Rounded Load	2 yards
Height, Loaded	64"
Height, Unloaded	65½"
Carrying Capacity	2½ tons
Fordson Hitch	Special Automatic
Weight, Complete	1960 pounds

SHOTS FROM THE · FIRING LINE ·

Central States Notes

G. L. Hinton is operating and Tom Stewart is firing a 225-B Bucyrus machine for the Primrose Producing Coal Co. at Jasonville, Indiana. Carl Beck is oiler on the job and O. S. Reintchler is cranesman.

On the second shift Harry Wilson is operating and Edgar Harrack is firing, while William Harrel is craning and Bill Johnson is oiler.

E. Dady is operating and John Hauck is firing a Marion 36 on the same job.

George W. Hawk is operating a Keystone ditcher for the Walsh Construction Company at Monee, Illinois.

Billy Geuberling is operating and Elijah Ellis is firing a Bucyrus 30-B dragline for M. W. Holben at Gary, Indiana.

Curt Gilligan is operating a Marion 252 for the Indiana and Ohio Coal Company, at Sponcler, Indiana.

Gilligan formerly was an engineer on a 225-B Bucyrus for the Linton Fourth Vein Coal Company, at Linton, Indiana.

Eastern News

BY E. G. LEWIS, NEW YORK

E. J. Eleam is operating a Marion 21 at Bristol, Virginia, for the R. W. Thurmond Company of Lynchburg, Virginia.

H. L. Bowers is operating a Thew electric shovel at Rocky Point, Virginia, for the Liberty Lime and Stone Company.

George Priest and Tom Gorman are operating Marion 70 standard shovels in the quarry of the Security Cement and Lime Company at Security, Maryland. Ed. Meyerly is operating a Marion 90 in the same quarry.

The Bernard E. Tighe Contracting Company of Phillipsburg, New Jersey, has contract for three miles of 8" by 20' concrete road, starting at Still Valley, New Jersey, and running to Bloomsberry, Warren County, New Jersey. There was 3000 yards of excavating for which he used a No. 4 Keystone.

The Spiniello Construction Company of 185 Market Street, Newark, New Jersey, has the contract for laying new sewer along Augusta Street, Irvington, New Jersey. They are using a 14-B equipped with clamshell boom and bucket. The material consists of old sewer and ordinary run of dirt. A. Inftno is operating the shovel. Herewith is a view of the above shovel in operation.

Peter Forke is firing a Bucyrus 30-B for the Lehigh and W. B. Coal Company at Kelayres, Pennsylvania.

Intermountain News

BY H. N. STEINBARGER, DENVER, COLORADO

It is with the deepest feeling of loss that we report the death of our old friend C. C. Watson, member of Denver Local Number 91 of the Brotherhood of Steam Shovel and Dredgemen. He was always in good standing in his brotherhood and with his fellow men, in other words a square shooter, and the loss will be felt keenly by all who knew him. He came to Colorado several years ago, in quest of a cure for a much broken-down system. He seemed to recuperate rapidly and soon took over the rebuilding and operation of the Fort Lyon Canal Company dredge, near Lamar, Colorado. After completing the unit he operated many shovels in various parts of the state, until during the past summer his health again failed, after which he sank rapidly toward the end. His work was always done with credit to himself and his employer — a record to be proud of and not to be forgotten.

Eggleston and Mathew, the old-time combination, is again functioning, after several years' separation. Eggleston decided to confine his activities to big ranch interests and stuck to it until a new railroad job loomed up, too big for him to overlook. The work consists of about 40 miles of new road running from Bernalillo, New Mexico, into a virgin forest. Private interests are building under supervision of Atchison, Topeka & Santa Fe Railroad Company's engineers and the latter will operate it upon completion. It's a nice job and we wish them much success.

At the time of going to press, it was reported that the Standard Engineering & Construction Company of Denver will be awarded the contract for 4¼ miles of concrete paving, bids for which were opened on October 15th by the State Highway Department of Colorado. It will be an entirely new road starting at city limits of Colorado Springs and running north to Breed, Colorado, where it will connect with the present highway. Heavy excavation for highway work will be encountered, and consists of 100,000 yards common, 17,000 yards solid rock, 12,000 yards borrow and fill, 42,000 statis yards overhaul, 44,000 square yards one-course concrete pavement and a bridge over Cottonwood Creek. Grading will be completed during the winter but no concrete will be laid until spring 1923. After completion of the new road, the old road running out of Colorado Springs along Monument Creek will be abandoned.

Hamilton & Gleason are again on the jump with a big job in the Sante Fe, under Sharp & Fellows Construction Company of Los Angeles. They broke in shipping out a 70-C Bucyrus and outfit from Denver and getting it on the job. They will complete their Denver & Rio Grande Railroad contract in Grand Junction about December first in good time, and will be glad to land on anything that looks good in railroad construction. Bob Gleason struck Denver early in November in good spirits and looking fine. Better than before his terrible accident, is the opinion of all who had the pleasure of seeing him. Watch your step Bob, we can't afford to have you tied up again.

Northwestern States News

BY A. R. HANCE, PORTLAND, OREGON

W. A. Beyers & Company of Spokane were the successful bidders for the construction of our 90-foot span steel bridges over the Coeur d'Alene River on the North Pacific Highway. The contract price was $45,030.40, and the state's estimate was $49,769.

Another contract in Idaho was awarded White & Jordan Company of Pierce for the construction of 2.3 miles of the Clearwater Highway, between Weippe and Pierce, known as the "Grasshopper Cutoff." The project is a state aid project, the Highway District furnishing $2 for each $1 put up by the State. The low bid was $9,866.34, while the state engineers had estimated that the work would cost more than $12,000.

The contract for the Belton-Java, Belton-Nyack Road project has been let to the Siems & Carlson Company of Spokane, Washington. This road shortly to be under construction is part of the National Forest Road project, located in the Flathead National Forest, state of Montana. The contract calls for the building of nearly seven miles of road and will cost $178,778.38, this being the lowest bid received. At present this is the only part of the Roosevelt Highway from Portland, Maine, to Portland, Oregon, that cannot be traveled, and the building of the new road will make it possible for tourists to drive their cars from Glacier Park to Belton instead of shipping them by railroad between stations as at present.

A contract for the construction of approximately

10 miles of the North and South Highway in Boundary County, state of Idaho, has been awarded to Morrison & Knudsen of Boise, Idaho. The estimate of the contractor was $91,494, while there were twelve bids submitted.

The General Construction Company was the lowest of thirteen bidders for the grading and surfacing of 10.21 miles of the North and South Highway, a federal aid project. The improvement will include 8300 lbs. structural steel, 1950 feet metal pipe, 125,100 yards earth excavation, 200 yards rock excavation, 14,000 yards gravel surfacing and 5300 linear feet guard rail. The bids were received by the Bonners Ferry County Court, Coeur d'Alene, Idaho, until October 21st. The bid of the General Construction Company was $81,922.96, and the Engineer's estimate was $87,232.95.

Work has already been begun for the crushing and surfacing of the Lewis County end of the Mission Creek Road, under the direction of Porter & Read of Culdesac, Idaho. During the summer the same firm constructed the Nez Perce County section of the Mission Creek Road, the work being paid for by the District. While the Lewis County section, nearly 2 miles long, lies in the Evergreen Highway District, Idaho, and is being built under the supervision of the commissioners of that district, the work is being paid for by the citizens along the right-of-way.

Pacific Coast Notes

BY P. H. BIRCKHEAD, SAN FRANCISCO, CALIFORNIA

Contract has been awarded to the Utah Construction Company, Phelan Building, San Francisco, by the Engineering Department, Southern Pacific Company, 65 Market Street, San Francisco, in connection with the construction of a 1200-foot single track railway tunnel at Rocky Point, Monterey County, tunnel to be concrete lined throughout, total length of 1200 linear feet including approaches.

Plans are being prepared by the Engineering Department of the Los Angeles & Salt Lake Railroad, 610 South Main Street, Los Angeles, and authorization has been granted by the Interstate Commerce Commission for the construction of about 32 miles of new railroad, from Lund to Cedar City, Utah. Estimated cost $800,000.00.

Bids have been received as follows for dredging 267,000 cubic yards in San Diego Harbor: San Francisco Bridge Company, San Francisco, bid per cubic yard $0.423, total $112,941.00; United Dredging Company, Central Building, Los Angeles, bid $0.3987, total $106,452. Recommended for acceptance.

The Jacinto Irrigation District, Willows, Glenn County, is considering the construction of a thorough drainage system, estimated to cost $100,000 or $9.00 per acre.

Plans are being made by Chief Engineer Ahern, for the construction of the proposed Idaho Central Railroad, from Rogerson, Idaho, to Wells, Nevada, via Contact. A large smelter, to cost $2,500,000, will be constructed at Contact.

Contract has been awarded to King & Malone, Washoe Bank Building, Reno, Nevada, $39,321.00 (only bidder) for 4.38 miles of grading and graveling in Eureka County.

Plans are being made by the Engineering Department of the Pacific Electric Company, Pacific Electric Building, Los Angeles, for the construction of a 5-mile extension to be built from San Dimas to Glendora, estimated cost $375,000.00.

Contract has been awarded by the Palmdale Water Company, Palmdale, Los Angeles, to W. H. Goff, Palmdale Water Company, Palmdale, for the construction of three earth dams near Palmdale, work involving: 80,000 cubic yards earth embankment; 140,000 square feet concrete slope pavement. Next two lowest bidders: C. Miles, Sacramento; C. H. Hudson, Los Angeles. Burt Cole, Palmdale, is chief engineer.

Plans are being completed for another unit of the Highway along the coast of Monterey County, first unit of which was let to George Pollock & Company, Forum Building, Sacramento.

Plans are being completed for 28.9 miles of the North Fork Highway through Feather River Canyon, from Jarboe Gap to Belden, involving approximately 640,000 cubic yards excavation and 160,000 yards overbreak.

About 12,000 acres of land in the proposed Honcut-Yuba Irrigation District, Honcut, Butte County, has been purchased by Tolosano & Smith, 1913 Fresno Street, Fresno, from the Yuba Land Company. The land will be subdivided into 20-acre tracts, and will be settled in the near future. Wells and pumping plants will probably be installed to supply the land with irrigation waters.

Application has been filed with the Railroad Commission by the Los Angeles Gas & Electric Corporation, for authorization to issue $3,000,000 first preferred stock, proceeds to be used to finance part additions and extensions to the Company's system.

Preliminary plans are being made by Engineering Department, Henry Cowell Lime & Cement Company, 2 Market Street, San Francisco, for the construction of a large cement manufacturing plant at Tehachapi, Kern County. Work will probably start next year.

A 21-mile narrow-gauge logging railroad will be constructed by the Swayne Lumber Company, San Francisco, and Oroville, in connection with the marketing of approximately 167,000,000 feet of timber in the Plumas National Forest recently purchased from the Forest Service. Work will probably proceed in small units, as the demand requires. Bids for a portion of the work will probably be taken next spring, the balance to be constructed by Company forces.

Plans and surveys are being prepared by Resident Engineer J. D. Isaacs, Calexico, for the Southern Pacific Railroad Company, for the construction of a standard gauge railroad from Mexicali to Labomba, on the Gulf of California. Railroad will be about 65 miles in length. It is proposed to start construction within a month or so.

Contract has been awarded to P. L. Burr, 512 Mission Street, San Francisco, who bid $336,814.00 for the construction of State Highway section of Skyline Boulevard in San Mateo County from Sneath Road to Half Moon Bay Road, 13.5 miles of grading and graveling.

Plans are being made by the Engineering Department, Union Pacific Railway Company, Omaha, Nebraska, and bids will be taken early in 1923 by the Engineering Department, Union Pacific Railway Company, 610 South Main Street, Los Angeles, for the construction of a large number of brick shop buildings and a 50-stall roundhouse to be erected near Belvedere Gardens.

Plans are also being prepared by the Engineering Department, Union Pacific Railway Company, Los Angeles, for the following work: Industrial Tract Development, consisting of about 2 miles paving, concrete or asphalt, and about 1 mile of sewer, also railway tracks, etc.; Machine Shop Tract Development consisting of 30 miles of railroad and approximately $100,000.00 of grading work.

George Pollock Company has started in moving dirt on their State Highway contract in Monterey County. Mr. Pollock is using a Bucyrus 30-B Diesel engine shovel and a Marion gasoline-electric shovel.

Mr. T. V. Cromwell and Mr. R. Henderson have just come down from the Western States Gas & Electric Company's work at Minden, Nevada. They state that the two 30-B Bucyrus shovels which have been at work there have been put away for the winter.

The Santa Fe Railroad has been granted a franchise for construction of a railroad from Los Angeles to Los Angeles Harbor.

Pennsylvania

The Blanchard Coal Company is operating a Bucyrus 225-B in two ten-hour shifts at Yukon, Penn-

sylvania. Roy Reeves is master mechanic and Sam Spooner is the superintendent on the job.

The Wiles Coal Company, also of Yukon, Pennsylvania, is stripping coal with a Marion 37 and are working two ten-hour shifts. The coal is being loaded with an Erie B which is operated by "Erie" Smith and Earl Meyer.

Southern States Notes

BY C. N. BALLENTINE AND W. W. WHORLEY, BIRMINGHAM

S. A. Lacy is loading material for the Southern Pacific Lines near Avondale, Louisiana.

E. W. Parker of Tampa, Florida, secured a nice piece of work on the Coast Line near Savannah, Georgia. The work consists of about twenty miles of double tracking between Ridgeland and Hardeeville, South Carolina. Mr. Parker intends to use a Bucyrus 80-C to handle the heavy grading.

Bids were opened on October 4th at Kingstree, South Carolina, for one and one-quarter million yards of drainage canal work. E. J. Doane & Sons of Lansing, Michigan, were the low bidders.

Considerable delay has been caused contractors in Southern Florida by the recent heavy rainfall in that section.

Phillips, Simpson & McGugin of Nashville, Tennessee, were awarded 11 miles of road work in Smith County, Tennessee, on October 27th. Mr. Y. Y. Phillips, formerly of Martin, Tennessee, is in direct charge of the work.

Bids were opened November 10th at Nashville, Tennessee, on ten miles of road work in Cocke County. This work is part of the Asheville to Knoxville Highway, and is situated between Newport, Tennessee, and the North Carolina state line. It follows in general the course of the French Broad River and involves some heavy excavation. The John L. Humbard Construction Company of Knoxville were low bidders on the grading and structures.

The Southern Engineering Company of Clarksdale, Mississippi, recently let contracts for a large amount of drainage work. The Winston Dredging Company secured 411,000 yards of floating dredge work. A. M. Alexander was awarded 167,000 cubic yards of dry land excavation.

Moore Bros. and Carr report satisfactory progress on their work at Johnson City, Tennessee.

The Alabama Mineral Corporation has recently been incorporated at Florence, Alabama. This company plans to acquire and develop large deposits of rock asphalt which are located in that district.

We regret to advise the death of Mr. J. O. Humphreys of Bessemer, Alabama. Mr. Humphreys was superintendent of the Brown Ore Mines of the Republic Steel Company at Ricky, Alabama. He leaves a large circle of friends and was prominent in Masonic interests in that district.

Several nice road jobs were let in Atlanta on November 1st.

Smith & Hall, Elberton, Georgia, were the successful bidders on Project No. 278 in Brook County.

W. C. Shepeard & J. L. Wallace, Decatur, Georgia, were low bidders on Project No. 244 in Coulquitt County.

Project No. 298 in Dougherty County was awarded to the Dougherty Board of Commissioners.

The Gould Contracting Company of Nashville, Tennessee, are making steady progress on their foundation work for the new highway bridge at Clarksville, Tennessee. The Nashville Bridge Company of Nashville, Tennessee, has contract for the superstructure.

St. Louis Items

BY A. B. KOENIG

Stone & Wormer have moved their team outfit on to a bank-widening job on the Missouri, Kansas & Texas Railroad that they subbed from L. J. Smith Construction Company.

Ed. Fitzgerald passed through here several days ago en route from Omaha to Leal Lameraux job at Calvin, Illinois.

Changes just made in all specifications for concrete pavement in Illinois it is declared will save the state about $1500 a mile. Henceforth specifications will call for pavement to be nine inches thick at the edge, graduating to six inches at the center. This change was made as a result of experiments on the experimental road near Bates which disclosed that practically all breaks occurred near the edge of the pavement. None occurred near the center. A previous change in specifications resulting from lessons learned at the Bates Road, by which the thickness of pavements was reduced from eight to seven inches, has saved the state $1,500,000, Frank T. Sheets, Superintendent of Highways, stated. The next specifications during the coming year will save the state approximately $2,000,000, it was stated. In view of these savings, state officials declare the Bates Road already has saved $3,500,000 for the state.

J. L. Bannon, 51 Young Building, Joliet, Illinois, has 20,000 yards of state road work near Joliet to sublet.

A. F. Brown of Jefferson City, Missouri, has been awarded the contract for building a mile of hard road on the Old Trails Highway, near Fulton, at an estimated cost of about $11,800.

J. C. Cox was awarded contract for stripping rock near Earlham, Iowa, by the Hawk Eye Portland Cement Company. About 1,500,000 yards of earth to be moved in this job. Cox figures that this job will hold him about two years.

C. A. Michael has a good wheeler and fresno outfit idle at Neponset, Illinois.

Moss & Moss of Nevada, Missouri, were awarded contract for state road between Nevada and Eldorado Springs, Missouri.

Baker & Koontz, Carthage, Missouri, were low bidders on state road work between Monett and Springfield, Missouri.

Walter Lemaster, Benton, Illinois, has finished his job there. He wants another one suitable for a 10-team outfit.

Graves & Bradley expect to have their 15-team outfit idle at Gladstone, Illinois. They would like to place this outfit on another job in Illinois, Missouri or Arkansas.

The Industrial Track Construction Company were awarded contract for building new yards for the Standard Oil Company at Baton Rouge, Louisiana.

J. E. McCaughey, Lawndale, Illinois, has 55,000 yards of road work near Good Hope, Illinois, to sublet.

T. E. Newell reports his 7-team outfit idle at Point Rest, Missouri. He wants a railroad job and if necessary will increase outfit and add a machine.

Alexander McClellan returned to Saint Louis. He is figuring on being in charge of a road job in Saint Charles County, Missouri.

C. R. Cummins and Roy Hatfield stopped off a day here on their way back from Dennison, Texas, to Cleveland, Ohio. The C. R. Cummins Company just finished grading the big yards for the Missouri, Kansas & Texas Railroad at Dennison. This Company has several good steam shovel outfits idle that they can place on work immediately. Swetland Building, Cleveland, Ohio, will catch them.

P. J. Murphy has sublet some of his Wabash work in Illinois to J. J. Williams and A. J. Sanders. He has also sublet a job of bank widening on the Wabash Railroad between Jonesburg and Pendleton, Missouri, and another piece near Montgomery City to Jos. Slaughter. Murphy has moved one of his own outfits to Montgomery City, Missouri, and another one to Valley City, Illinois.

P. J. McGraw, 2232 McCausland Avenue, Saint Louis, Missouri, has 8 teams that he would like to place on some work in this part of the country.

Al Gilliland expects to finish his work at Porum, Oklahoma, in a few days. He is looking around for another job for his 25-team outfit.

Grant Smith & Company report making rapid progress on their different jobs on the Frisco Railroad in Missouri during the past month.

The State Departments of Public Works and Buildings, Division of Highways of Illinois, on October 31st opened bids for 125 miles of pavement, 38 miles of heavy grading and 12 separate bridges, all located on the State Bond Issue Road System. A total of 395 bids were received. The average price per mile for all of the pavement bids received was $25,600, including cement, which is a new and low average for the department, it was announced. The maximum avereage price per mile received on any single section was $29,400 per mile, including cement, and the lowest price $22,350 per mile, including cement. The total value of the work for which bids were received is approximately $3,800,000. All of the bids received are for the standard reinforced pavement, eighteen feet width.

The work advertised is located in the following counties: Cumberland, DeWitt, Effingham, Ford, Franklin, Grundy, Iroquois, Kankakee, Kendall, Knox, Marshall, McHenry, Mercer, Perry, Rock Island, Schuyler, Shelby, Tazewell, Wayne, Whiteside and Will.

The Alzine Construction Company was low bidder for grading on Bond Issue Route No. 16, in Shelby County. Their figure was $16,503.23. The W. H. Shons Company was low bidder with $12,692.30, for a bridge in Shelby County.

Contractors when in want of work or labor for their outfits write or wire Koenig Labor Agency, 612 Walnut Street, Saint Louis, or 501 Delaware Street, Kansas City, Missouri.

Canada

Vancouver Notes

Contracts involving an expenditure of approximately $40,000 were awarded by Harbor Commissioners to three Vancouver, British Columbia, firms for the building of a single rail track from the government wharf to the new Ballantyne pier. Contract for embankment construction was given to Grant, Smith & Company, contract for light grading, track laying, ballasting and supply of ties to E. J. Ryan & Company, and for supply of rails, switchstands, etc., to Leath, Murray & Company.

Tenders will likely be called shortly for completion of the Point Grey-Vancouver partnership water main. Estimated cost, between $80,000 and $90,000. City Engineer, F. L. Fellowes.

The Council of Point Grey, British Columbia, awarded contract for sewerage work to Harrison & Lamond at $23,201. Other tenders received were: Nick Cosco, $34,079; Scott & Anderson, $26,790; Nixon Construction Company, $31,699.

Construction of streets and sidewalks on a large scale next year was forecasted at a meeting of the Civic Board of Works of Vancouver, British Columbia, when F. L. Fellowes, City Engineer, submitted a report on the question.

Thomas Bulman, president of the British Columbia Fruit Growers, Ltd., is agitating for the completion of the Canadian National Railroad lines from Kamloops to Kelowna, with a branch to Lumby, a distance of about 100 miles.

Montreal and Vicinity

BY J. M. WARD, MONTREAL

The Province of Quebec, Department of Highways, is letting contracts this fall for 275 miles of gravel and macadam roads.

The City of Quebec is contemplating a $50,000.00 iron bridge, 3 spans 100 feet, 40 feet wide.

The Southern Canada Power Company of Drummondville, Quebec, are preparing plans for a $700,000.00 dam and power plant at Heming's Falls. It is expected work will proceed early in the spring.

Bedford Construction Company, Halifax and St. John, New Brunswick, is loading a schooner with plant and supplies for construction of their ten-mile railway contract in Kingston, Jamaica. The work will be under the personal supervision of Jim Cavicchi.

Some big power development plants in the Province of Quebec are well under way and construction work should not be very far off. The Quebec Development Company are expected to start immediately on a $10,000,000.00 hydro-electric development.

About 75% of the road contracts awarded in the Province of Quebec this year have been completed.

We recently had a visit from Mr. E. G. Cameron, Chief Engineer of the St. John Drydock & Shipbuilding Company at St. John, New Brunswick.

O'Connor Bros., have made very good progress on all their road contracts this year and have practically finished for this season.

B. M. Hill, Chief Engineer, Department of Public Works, Government of New Brunswick, was a recent visitor to Montreal.

Winnipeg and Vicinity

BY F. X. AMOS

E. V. Caton, formerly Chief Engineer of the Winnipeg Hydro-electric System, has resigned to accept an appointment as Electrical Engineer with the Winnipeg Electric Railway Company.

Franklin P. Brady, Assistant to the Executive, Canadian National Railways, died at his home in Winnipeg, October 21st, after a long illness. Mr. Brady was one of Canada's foremost railway men, having been connected with that service since 1869. His body was taken to Concord, New Hampshire, where the funeral took place on October 25th.

The new Board of Directors of the Canadian National Railways made their inspection trip over the Western Lines the latter part of October. Plans for the electrification of some of the Canadian National Branch lines in Manitoba will be among the first questions to be considered by the new Board.

The municipalities between Winnipeg and Portage La Prairie are petitioning the Provincial Government for assistance in repairing the dikes along the Assiniboine River.

Hon. Charles Stewart, Minister of the Interior, is organizing a committee of coal and mining experts to investigate the possibilities of adapting Canadian soft coal to furnace use. The committee will be under the chairmanship of Dr. Charles Camsell, Deputy Minister of Mines.

J. Wilkie, Assistant Superintendent of Equipment, Canadian National Railways, has returned from a short holiday in Vancouver.

Toronto and Vicinity

BY C. F. ENGLAND

The Sheridan Construction Company of Burlington, Ontario, have completed a fine piece of waterbound macadam road for the Provincial Highways Department in the vicinity of Woodstock, Ontario. Mr. Sheridan, President, and his two sons made Woodstock their headquarters while carrying out the work, and became both popular and well known in the vicinity.

The contract for excavation of 17,000 cubic yards of earth and 900 cubic yards of rock in connection with the drainage work at Judge's Creek, near Lion's Head, Ontario, has been let to Bryson & Irwin, Wiarton, Ontario.

McNamara Brothers & Thornton are nearing the completion of large Provincial Highway contract in the vicinity of Guelph, Ontario, which included both grading and hard surface work. Mr. Thornton has made Guelph his headquarters while looking after the work. This firm is also engaged in Provincial Highway work just east of Toronto, which includes some extensive grading.

Since we wrote last month's notes the Provincial Highway Department let a very considerable contract to the E. G. Law Construction Company of Toronto for

excavating and grading a new road between Danforth Avenue and Kingston Road northeast of Toronto. In spite of the advanced season of the year the Contractors expect to have all the heavy grading finished before snow flies, unless winter comes upon us sooner than usual.

The McArthur Engineering & Construction Co., opened up a new gravel pit last summer within the city limits of Guelph, Ontario, which has proved a very satis-

Equipment Owned by the McArthur Engineering & Construction Company of Guelph, Ontario

factory undertaking and the Company is to be congratulated on the fine start they have made. The originator of the Company, Mr. F. McArthur, has, up to the present, been City Engineer of Guelph and under his guidance many important city improvements have been carried out. Mr. John Kennedy is President of the new Company.

The Dufferin Construction Company, Ltd., were awarded the contract by York Township for heavy excavation and grading of a new road commencing at Stop 23 on the Kingston Road, east of Toronto. This involved a heavy cut at one point to almost thirty feet high. The Company went at the job with characteristic energy about the first of November, putting three steam shovels to work at the start.

A new contracting concern has just been incorporated under the name of the Ontario Construction Company, Ltd. Incorporation papers show capitalization at $50,000 under the application of Mr. M. A. Seymour.

One of the first applications of the small tractor to excavation of cellars in this vicinity was made by Mr. Pepper of Pepper's Garage, Ltd., Toronto, who employed a small caterpillar tractor and a 5-foot Fresno Scraper on the excavation work for the Jarvis Street School. The tractor was connected to the scraper by a special hitch which enabled the operator both to load and dump the scraper without leaving his seat.

The Towland Construction Company, as we go to press, has closed their grading camp at Kenilworth, Ontario, where they have been doing considerable work for the Provincial Highways Department. Mr. J. S. Mitchell, the head of the Company, advises us that he has transferred a large part of his teaming equipment and teams to work in the north country on lumbering over winter.

It has been announced that Mr. E. L. Cousins, Chief Engineer and General Manager of the Toronto Harbor Board, has sent in his resignation. The work carried out on the Toronto waterfront under his guidance has been one of the most extensive of its kind and includes dredging and reclamation of a very considerable acreage of valuable waterfront property. Mr. Cousins, up to the present, has been connected with projects of this kind amounting to thirty or forty millions of dollars. It is said that he contemplates embarking on private practice in special engineering lines.

REVIEW OF BOOKS and CATALOGS

We shall be glad to review, in this column, such books and catalogs as are sent to us.

COLLINE — AND HOW TO USE IT — A 3 x 6-inch, 12-page booklet describing in full the various uses of Colline Boiler Compound. Anyone who is at all interested in the use of boiler compound will find this little booklet of absorbing interest. In relation to the use of this compound there is a portion thereof devoted to the care of steam shovel boilers. Booklet EE may be obtained free of charge from the *Chicago Chemical Company, 420 North Western Avenue, Chicago, Illinois.*

TRADE NOTES

Ransome Concrete Machinery Company Will Enlarge Plant Again

An increased volume of business, particularly in the Paving and Small Mixer fields, has necessitated a further enlargement of the plant of the Ransome Concrete Machinery Company, of Dunellen, New Jersey. Something over a year ago this concern practically doubled its floor space and the decision to erect the new building — adding a third as much more space — augurs well for their belief in not only continuance but an increase in present building activities. The structure, one story in height with monitor roof, will be concrete and steel and covers a ground area of nearly 10,000 square feet. Its erection will be commenced immediately.

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